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it is easy to see, as in the other case, how the necessary motion is given to AS, the line in the plane of the mirror. But further the plane of the mirror must remain perpendicular to the plane ASA′. To secure this, that central line of the mirror which is perpendicular to the driving rod is constrained to remain perpendicular to CA, the direction of the fixed reflected ray. Thus the plane of the mirror contains a line which is perpendicular to two lines in the plane of reflexion, and the required condition is fulfilled. A small instrument, which has been found very useful, has been designed by Dr. Johnstone Stoney on this principle. The siderostat of Foucault combines some of the features of both types, the motion of the mirror being controlled partly by the normal rod and partly by a slotted bar in the plane of the mirror and passing over a rod which is the prolongation of TC′ (fig. 2). The bar is thus kept parallel to AS (fig. 1), as is easily seen, and provides the means of maintaining automatically the longer dimension of the mirror (if this is neither circular nor square) in the plane of reflexion.

The description of these instruments is of course too brief to convey a very satisfactory idea of the details of their construction. What is aimed at is to point out the relations of the different types. The principles outlined here will probably suffice to render the mechanism of any particular instrument immediately intelligible on inspection of the concrete example.

Oxford: 1901 May 9.

The Spectrum of Nova Persei. Note 4.

By the Rev. Walter Sidgreaves, S.J.

In note 3 on the spectrum of *Nova Persei* in the last number of *Monthly Notices* it was observed that at the times of minimum of the light curve the bright Hζ band was greatly extended on its violet side, and that one of the blue bands appeared to be too bright to be satisfactorily explained by the greater contrast of a weaker continuous spectrum.

The photograph of March 28 shows two prominent lines of greater brightness in the so-called extension: one at its red side adjoining, or perhaps overlapping, the hydrogen band ζ, and the other near its margin on the more refrangible side. The wavelengths of these two lines are found to be 3882 and 3859, referred to the centre of bright Hβ. The extension may therefore be a cyanogen band, composed of the nineteen lines measured by Lockyer * between 3883 and 3855, of which the strongest lines are 3883, 3871, 3862, and 3855; and it will be convenient to call it, provisionally, the CN band. This band and the most prominent of the blue bands at 4633 are the characteristic features of the spectrum at the minima of the light curve. Both bands either

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* Watts, Index of Spectra 168, revised edition.

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come into being at these times, or are completely absorbed at times of greater general brightness of the star, neither of them being accounted for by the greater contrast of a feebler continuous spectrum; for at Hζ the continuous spectrum was never so bright as the CN band, and the blue band is not a previously existing band grown stronger, but it occupies the space between two previous bright bands, in the same manner as the CN band occupies the space between Hζ and Hη.

The dates on which this spectrum has appeared are indicated by the brackets in the following list, and may be called the minimum type: February 28, March 3, 7, 8, 12, 16, 17, 20, 21 (22), (25), 27 (28), April 1, 4, 5, 9 ? (11), (12), (13), (16), 19 (20), (21), 23 (25), (26). On the other dates not in brackets the CN band is completely absent, and the blue band 4633 is replaced by a pair of bands, one on each side of its position. And it is noteworthy that the pair of bands appeared for the first time on March 21, the day before the first photograph of the minimum type spectrum. They had formed from a very broad bright band covering about 5 $\mu\mu$, which had been a constant feature of the spectrum from February 28 to March 20.

The query written against April 9 in the above list of dates signifies uncertainty of the type of spectrum on that date. It seems to be in the state of transition from the non-minimum type to that of the minimum, or *vice versa*; the CN band is absent, but the blue band 4633 is present in a diffusive state, and not strong, and without its otherwise constant companion at 4681.

The radiant energy of the CN band seems to be very great. On the later dates, notwithstanding the low altitude of the star and the sensibility curve of the plate, it is stronger than Hδ. At the same time a remarkable change appears in the relative strengths of Hε and Hδ. On the spectrographs of April 16, 20, 25, and 26, Hε is stronger than Hδ, and the CN band is stronger than Hε; so that the relative intensities of these three bands are in the inverse order of the sensibility curve, and the relation is not exaggerated by expressing the density of the silver deposit at Hδ by d, and writing $2d$ and $3d$ for the densities at Hε and the CN band.

Stonyhurst College Observatory:
1901 *May* 5.

The Visual Spectrum of Nova Persei.

By the Rev. A. L. Cortie, S.J.

The following observations of the visual spectrum of *Nova Persei* were taken by means of an equatorially mounted refracting telescope with an excellent 5-inch object glass by Alvan Clarke, but without clockwork, and a McClean eyepiece star spectroscope of small dispersion. The estimates of the magnitude of the star during the times of the observations, after the star

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